Space Weather Forecast

Issued on Sunday, 09 October 2022 at 01:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class X-ray flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low with any flares remaining at common class. There are six sunspot regions on the Earth-facing disc. The largest, and most complex region has now transitioned into the northwest disc, but has persisted as a stable area. It has seen some limited spot development amongst its intermediate spots, but also and ongoing gradual decay of its leader spot. A further spot to the north of the large one is a smaller and also stable region, but this was the source of the most recent Moderate flare which occurred on the 7th. Another spot region in the northeast disc has exhibited some growth in areal extent during the last 24 hours, but remains a relatively simple, and small region. The other regions are smaller and generally decaying. No Earth-directed CMEs (coronal mass ejections) were observed.

Solar Wind / Geomagnetic Activity: The solar wind persisted at mainly elevated levels, with speeds between 480 and 550 km/s. The strength of the magnetic field remained weak, with the north-south component variable, but more frequently weakly negatively (southward) pointed rather than weakly positive (northward). Geomagnetic activity was Quite to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Low with a chance of rising to Moderate with any M-flares. There is an ongoing slight chance of rising to High due to the potential of AR3112 producing an isolated X-flare.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs, however one may pass close to the Earth either late day 3 or early day 4 (11th or 12th), giving some very slight peripheral influences. Otherwise, ongoing fast winds are likely to only gradually ease through the period, approaching or falling to background day 4 (12th). Geomagnetic activity is forecast to be Quiet to Unsettled. Active intervals are possible day 1 and perhaps day 2 (9th and 10th), with a slight chance of G1-Minor Storms day 1 (9th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has the potential to rise due to any significant flaring that occurs, especially from the large sunspot on the disc. This has a slight chance of reaching the S1/Minor Radiation Storm level.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	1	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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